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ABSTRACT

A needs assessment of microcomputer use in Illinois school districts was conducted as a basis for developing resources for identifying microcomputer applications for administrative, instructional, and student purposes. A 20-item questionnaire mailed to 200 Illinois school district superintendents and administrators addressed current and potential microcomputer uses, current competencies needed by educational personnel for educational computing, type of computers being used, and the role and cooperative efforts of the State Board of Education and regional consortia in expanding microcomputer use in the districts. Responses to questionnaire items are tabulated by size and type of school district, or--for six open-ended questions--analyzed by frequency of common responses. Overall results from the 104 returned questionnaires indicate that the uses and problems of microcomputers appear to be similar in most Illinois school districts. The majority use their microcomputers for both administrative and instructional purposes, including awareness, literacy, programming, and computer assisted instruction (CAI) in all areas. Needs for assistance in CAI/computer education, better software, staff training, and funding, are indicated, as well as a lack of leadership and assistance by the Illinois State Board of Education. (LMM)

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A SURVEY OF MICROCOMPUTER USE IN ILLINOIS SCHOOL DISTRICTS

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The increasing presence of microcomputers in schools seems to be generating a new energy and motivation for students, teachers and administrators alike. Considering that microcomputers have only been available for purchase by the schools since 1977, it is surprising how rapidly they have been integrated into many facets of educational use.

For the administrator, as an efficient secretarial aid and tool for manipulating data, microcomputers can be a cost-effective solution to many of the day to day management functions of a school or school district. Readily available microcomputer software provides valuable time saving applications to assist with scheduling, accounting and a variety of other tasks which would require considerably more time and manpower if a microcomputer were not available.

Using microcomputers means increased efficiency in managing instruction for the classroom teacher. More quickly than ever before, teachers can choose individual remedial instruction as well as enrichment programs. Tutor mode CAI can provide an individualization of instruction that cannot be matched by a teacher who must deal with large numbers of students. In addition, teachers have more time to personalize learning if computers take over time-consuming paperwork that accompanies the management of instruction.

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The microcomputer is the first technology that offers true interaction with the learner. It can present problems and activities to the learner, and on the basis of his responses, vary subsequent problems and activities. It can evaluate a student's progress and modify the pace, difficulty or nature of the instruction. The microcomputer can be personally useful to students as an aid to problem solving as well as an object of learning in itself through the discipline of computer science. These students will need to prepare for the jobs of the future, a great number of which will be available in the computer field.

On the other hand, some educators question whether learning to program sharpens the mind to any greater degree than the traditional, low-technology disciplines of learning to debate, to prove geometry theorems or to write in a foreign language. Also, job prospects in computing may not be as bright as they seem because although there is a severe shortage of experienced programmers, there is a glut of beginners. One major source of computer industry employment, data entry, is drying up as machines that can read and listen take over jobs once held by clerks. There are also dangers in misusing software as they are often not verified for effectiveness and pertinence.

Illinois school districts have purchased microcomputer equipment but there is evidence that many school districts do not have trained personnel to use the equipment, nor the

knowledge of its application in education. This being the case, a needs assessment of Illinois school districts' microcomputer use would provide a basis for developing needed resources for identifying microcomputer applications for various administrative, instructional and student purposes.

Statement of the Problem

The purpose of this study is to determine the needs assessment and use of microcomputers in Illinois school districts.

Questions Studied

1. How are microcomputers currently being used at the local school level?
2. What potential applications of microcomputers for educators are found at the local school level?
3. What are the common competencies needed by administrative, instructional, and student services personnel for the application of microcomputers in the schools?
4. What type computers are being used in Illinois school districts?
5. What are the role and cooperative efforts of the State Board of Education and regional consortia with respect to the expansion of microcomputers in Illinois school districts?

Population and Sample

The population selected for this study included approximately 1090 elementary and secondary school districts in Illinois. Two hundred Illinois school districts were randomly selected as the sample.

Method of Data Collection

The information was collected via a non-normative survey of two hundred selected Illinois school districts. A twenty-item Microcomputer Needs Assessment Questionnaire was mailed to Illinois school superintendents and administrators in the sampled school districts. Respondents were asked to indicate the number of students, number of elementary schools and number of secondary schools in their districts. Of the two hundred questionnaires distributed, one hundred four were returned with completed responses to the fourteen forced answer questions. Eighty-nine respondents answered the six short answer questions. Four participants failed to adequately complete the questionnaire and therefore could not be included in the study.

Treatment of the Data

The findings were tabulated in terms of percentages according to size (enrollment) and type (elementary, secondary, or combined) of district. Open-ended questions were analyzed by frequency of common responses. Statistical treatment and cross tabulation were done by the CSU Co-op computer using SPSS software.

RESULTS

The overall results show that the uses and problems of microcomputers appear to be similar in most Illinois school districts. The majority use their microcomputers for administrative and instructional purposes, including awareness, literacy, programming and CAI in all areas. There is a need for assistance in CAI/computer education, better software, staff training and funding. The data show there is a lack of leadership and assistance by the Illinois State Board of Education.

Findings

One hundred four school districts returned usable surveys. Table I shows the numbers of school districts by size (enrollment) and type (elementary, secondary and combined).

Table I. SIZE AND TYPE OF SCHOOL DISTRICTS

SIZE				TYPE			TOTAL
<300	300-2,000	2,000-5,000	5,000-10,000	ELEM.	SEC.	COMB.	
No.=%	No.=%	No.=%	No.=%	No.=%	No.=%	No.=%	NUMBER
20=19%	60=58%	15=14%	8=8%	24=23%	5=5%	71=68%	100
%				%			
A TOTAL OF 1% IS NOT SHOWN WHICH REPRESENTS (1) INCOMPLETE CATEGORY.				A TOTAL OF 4% IS NOT SHOWN WHICH REPRESENTS (4) INCOMPLETE CATEGORIES			

The demographic data in Table I show the majority of surveyed school districts, 58 percent, had enrollments between 300 and 2,000 and 71 percent were combined districts.

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The responses to "What types of microcomputers are being used in Illinois school districts?" are presented in Table II. Results are presented in percentages.

Table II. TYPES OF MICROCOMPUTERS USED IN SCHOOL DISTRICTS

TYPE OF COMPUTER USED:	TOTAL	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
APPLE	34%	45%	33%	7%	50%	46%	40%	28%
TRS-80	4%	5%	3%	7%	---	---	---	6%
COMMODORE	1%	---	---	7%	---	4%	---	---
IBM/PC	1%	---	3%	---	---	4%	---	---
ATARI	1%	---	---	7%	---	4%	---	---
2--TYPES	46%	45%	50%	33%	50%	38%	40%	49%
3 OR MORE	14%	5%	12%	40%	---	4%	20%	17%

In districts with less than 300 students, an equal percentage (45%) use Apple computers only, versus two different types of computers. Few districts of this size use TRS-80 only (5%) and only 5 percent use three or more types of microcomputer.

More districts (50%) in the 300 to 2,000 enrollment group use two types of microcomputer. Apple is used by 33

percent and very few districts (3%) use TRS-80 only. IBM/PC is used by a smaller percentage (2%) of districts in this group and 12 percent use three or more types of computer. In the 2,001 to 5,000 size districts only one district each (7%) uses Apple, TRS-80, Commodore/Pet or Atari only. More districts (33%) use two types of computer and even more districts (40%) in this enrollment group use three or more types of microcomputer. Apple is the most popular computer in 50 percent of districts of the largest enrollment group and the remaining half (50%) use two types of microcomputer.

The findings indicate that regardless of district size more districts (47%) use two or more types of microcomputers, but in the districts using only one type, the Apple is the most popular microcomputer.

Of the twenty-four elementary school districts, 46 percent use Apple only, while 38 percent have two types of microcomputer. An equal percentage of the secondary school only group (40%) use Apple only or have two types of computer. Of the seventy-one combined school districts, more districts (47%) use two types, while 34 percent use Apple only and 14 percent use three or more types of microcomputers.

The findings indicate that combined school districts of elementary and secondary schools are more likely to use two types of computers and elementary schools are more likely to have one brand of computer, the Apple.

The responses to "How many microcomputers are used in the school district?" are presented in Table III.

Table III. NUMBER OF MICROCOMPUTERS IN USE IN SCHOOL DISTRICTS

NUMBER OF COMPUTERS IN USE:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
1 TO 5	21%	60%	15%	---	---	29%	40%	28%
6 TO 10	14%	20%	18%	---	---	13%	20%	16%
11 TO 25	41%	20%	55%	33%	13%	33%	40%	44%
26 OR MORE	23%	---	12%	67%	88%	25%	---	25%

A majority (60%) of the districts of 300 students or less own five or fewer microcomputers, 20 percent have from six to ten computers, 20 percent have eleven to twenty-five, and no school district of this size has more than twenty-five microcomputers.

In districts of 300 to 2,000 students, 15 percent have five or less computers, 18 percent own from six to ten, a majority (55%) own from eleven to twenty-five and 12 percent have twenty-six or more microcomputers.

Where the enrollment is between 2,001 and 5,000 students, a majority (67%) own twenty-six or more computers and the remaining districts (33%) in this enrollment group have from eleven to twenty-five computers.

In the largest enrollment group, only one district (13%) has less than twenty-five microcomputers, whereas the majority of this size district (88%) have more than twenty-six computers. As expected, the greatest number of microcomputers are found in the largest districts.

Thirty-three percent of elementary, 40 percent of secondary and 44 percent of combined school districts own eleven to twenty-five microcomputers, while 29 percent of elementary and 40 percent of secondary school districts have only one to five computers. Forty percent of all school districts possess eleven to twenty-five microcomputers.

The findings indicate that combined school districts own more computers than single type school districts.

The responses to "How does the district evaluate the use of microcomputers?" are presented in Table IV.

Table IV. DISTRICT EVALUATION OF MICROCOMPUTER USE

DISTRICTS SURVEYED:	TOTAL	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
EVALUATION	DIST.							
VERY SATISFIED	60%	50%	58%	53%	100%	67%	80%	55%
SATISFIED	38%	45%	38%	47%	—	33%	20%	41%
UNDECIDED	3%	5%	3%	—	—	—	—	4%
DISSATISFIED	—	—	—	—	—	—	—	—

A majority of all schools (60%) indicate that they are very satisfied with the use of microcomputers in their schools. All districts (100%) in the largest enrollment group are very satisfied.

Many districts surveyed in the first three enrollment groups (55%, 38%, and 47% respectively) are satisfied with the use of microcomputers in their schools.

A few districts in the two smaller enrollment groups (5% and 3%) indicated that they were undecided about their evaluation and no school districts in any group indicated dissatisfaction with microcomputer use in their schools.

Since 100 percent of the largest districts are very satisfied and data from Table III indicate that these districts have the most microcomputers, the indication would be that the more computers in use, the more satisfied the districts are.

Another 38 percent of all districts are satisfied and only 3 percent of the districts report that they are undecided.

A significant majority (80%) of the secondary school districts are very satisfied, while only 20 percent are only satisfied with their microcomputers.

Sixty-seven percent of elementary school districts are very satisfied with their microcomputers, whereas 33 percent are satisfied.

Similarly, in the combined districts, a majority (55%) is very satisfied and (41%) are satisfied with microcomputer use in their schools.

The findings indicate that type of school district less significantly influences the evaluation of microcomputer use in the school districts.

The responses to "Where are the microcomputers primarily located?" are presented in Table V.

Table V. LOCATION OF MICROCOMPUTERS IN THE SCHOOLS

DISTRICTS SURVEYED:	TOTAL	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
LOCATION:	DIST							
LIBRARY	7%	20%	3%	7%	—	4%	40%	4%
CLASSROOMS	17%	20%	20%	7%	—	17%	20%	18%
LABORATORY	14%	20%	8%	20%	25%	17%	—	13%
OFFICE	—	—	—	—	—	—	—	—
TWO / MORE LOCATIONS	63%	40%	68%	67%	75%	63%	40%	65%

An equal percentage (20%) of districts smaller than 300 students locate their microcomputers in the library, in the classrooms or in a computer laboratory while more districts (40%) of this size house their computers in two or more locations.

Only three percent of the districts with 300 to 2,000 students have their microcomputers in the library, 20 percent in the classroom, 8 percent in the computer laboratory. A majority, (68%) of these districts keep their computers in two or more locations.

The microcomputers in seven percent of the districts with 2,001 to 5,000 students are located in the library, 7 percent in the classrooms, 20 percent in a computer laboratory and the majority (67%) in two or more locations.

In the larger districts of over 5,000 students, microcomputers are not located in the library or classrooms alone, but the are located in the computer laboratory in 25 percent of these districts. Again, the majority (75%) install their microcomputers in two or more locations.

The findings indicate that the majority of school districts (63%) do not have their microcomputers located in any one place but that the larger the school district the more likely it is to have a computer laboratory for its microcomputers.

Regardless of district grade span, microcomputers are located in two or more locations in most of the districts (63%). In the secondary school districts, 40 percent keep their computers in the library, whereas 18 percent and 13 percent of combined school districts set up their computers in classrooms and computer laboratories, respectively. Elementary school districts use the classrooms (17%) and laboratory (17%) to house their computers.

The data indicate that most districts (63%) use two or more locations for their microcomputers.

The responses to "For what are the microcomputers used?" are depicted in Table VI.

Table VI. MICROCOMPUTER USE IN THE SCHOOL DISTRICTS

USE OF COMPUTER:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
ACCOUNTING/SCHEDULES / BUSINESS RECORDS	---	---	---	---	---	---	---	---
STUDENT RECORDS	---	---	---	---	---	---	---	---
STUDENT INSTRUCTION	25%	60%	18%	13%	---	42%	60%	16%
INSERVICE TRAINING/ STAFF / TEACHERS	29%	10%	27%	47%	63%	29%	20%	31%
BUSINESS RECORDS / STUDENT RECORDS / TESTS	1%	---	2%	---	---	---	---	---
ACCOUNTING / BUSINESS RECORDS / INSTRUCTION	40%	30%	47%	33%	38%	29%	20%	45%
ALL AREAS	5%	---	7%	4%	---	---	---	7%

The data in Table VI show that 60 percent of the school districts of under 300 students use their computers for student instruction only, 10 percent for inservice training of staff and teachers and 30 percent use their computers for all areas including instruction, inservice, business records, and accounting.

However, in larger districts (300 to 2,000) only 18 percent use their computers for instruction only, while 27 percent use them for inservice training of staff and teachers, 2 percent for business records only, 7 percent for all areas and 47 percent for accounting, business records and student instruction.

The school districts with 5,000 students or more use their computers mostly (62%) for inservice training (staff and teachers), with the remaining 38 percent using them for accounting, business records and student instruction.

The data indicate that most districts use microcomputers for inservice training (36%) and for accounting, business records and student instruction (37%).

The greatest percentage of combined school districts use their microcomputers for accounting, business records and student instruction, 31 percent for inservice training of staff and teachers. Only 16 percent of these districts use their computers for student instruction only.

Elementary and secondary school districts use their microcomputers primarily for student instruction (42% and 60%). In the elementary only group an equal percentage (29%) of the districts cite staff and teacher training and accounting, business records and student instruction as the primary use of their microcomputers. Similar usage was noted in secondary districts with 20 percent in each of the above catagories.

The findings indicate that the combined districts are more likely to have varied use of their microcomputers, while the elementary only and secondary only groups use their computers for student instruction only.

The response to "How are the microcomputers used in the school districts instructional program?" are presented in Table VII.

Table VII. INSTRUCTIONAL USE OF MICROCOMPUTERS

USE OF COMPUTER:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
AWARENESS / LITERACY	14%	10%	18%	7%	13%	13%	—	17%
INTRO. PROGRAMMING	2%	5%	2%	—	—	—	20%	1%
ADVAN. PROGRAMMING	—	—	—	—	—	—	—	—
C A I / INDIVIDUAL INSTRUCT.	9%	20%	8%	—	—	17%	—	6%
ALL ABOVE AREAS	49%	55%	43%	73%	25%	54%	40%	47%
ALL ABOVE AREAS and WORDPROCESSING	7%	5%	7%	—	25%	—	20%	9%
ALL ABOVE AREAS and REMEDIAL	10%	—	15%	—	13%	4%	20%	11%
LITERACY INTRO. / ADVANCED PROGRAMMING	8%	5%	3%	25%	5%	13%	—	7%

Results in Table VII show how microcomputers are used in all areas of instruction--including awareness and literacy, introduction to programming, and computer assisted instruction (CAI) in a majority (55%) of the districts having less than 300 students. Ten percent of these districts use their computers for teaching awareness and literacy only, 5 percent for introduction to programming only and 20 percent for CAI only. In addition to all areas of instruction, wordprocessing and advanced programming is included by 5 percent of these smaller districts.

Similarly, in districts with 300 to 2,000 the majority of districts (43%) use microcomputers for all areas of instruction. Seven percent included wordprocessing and 15 percent remedial instruction in addition to the other areas of computer instruction and CAI. Awareness and literacy only are taught in 19 percent of these districts, introduction to programming in 2 percent and CAI (8%), and advanced programming is added to computer awareness, literacy and introduction to programming in 3 percent of these districts.

In districts of 2,001 to 5,000 students, again the majority of districts (73%) use their microcomputers for all areas of instructional use. None include wordprocessing or remedial instruction, while only 7 percent teach only awareness and literacy and 20 percent include introductory or advanced programming.

In districts with 5,000 students or above 13 percent teach awareness and literacy, 25 percent programming, CAI, awareness, literacy and wordprocessing. Remedial instruction is taught in 13 percent, while 25 percent use their microcomputers to teach awareness, literacy, introduction to programming and advanced programming. The size of district does not seem to influence microcomputer instructional use.

Regardless of district type, the greater percentage of the districts (49%) designate awareness, literacy, introduction to programming, advanced programming, and CAI as the primary instructional uses of microcomputers in their schools.

In elementary school districts, 17 percent use their computers for CAI only, 13 percent for awareness and literacy only, and 13 percent for awareness, literacy, introduction to programming and advanced programming.

Sixty percent of secondary school districts evenly divide between introduction to programming (20%), awareness, literacy, programming and wordprocessing (20%), and remedial instruction (20%).

In combined districts, 17 percent teach awareness and literacy, 11 percent introduction to programming, advanced programming, CAI, and remedial instruction. Nine percent include wordprocessing and 7 percent add advanced programming to introduction to programming and awareness and literacy.

The responses to "In which specific instructional areas are microcomputers used?" are presented in Table VIII.

Table VIII. SPECIFIC AREA OF MICROCOMPUTER INSTRUCTIONAL USE

INSTRUCTIONAL AREA:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
INTROD. TO COMPUTER LANGUAGES	23%	25%	23%	20%	25%	17%	60%	24%
MATH SKILLS	7%	15%	3%	13%	—	4%	—	9%
L A / READING	3%	5%	3%	—	—	13%	—	—
VOCATIONAL EDUCATION	1%	—	2%	—	—	—	—	1%
COMPUTER LANGUAGES / MATH / READING L A (LANGUAGE ARTS)	22%	25%	20%	27%	13%	21%	—	21%
ALL ABOVE AREAS and SOCIAL STUD./SCIENCE	16%	25%	18%	7%	—	29%	20%	11%
ALL AREAS	19%	5%	23%	20%	25%	8%	20%	24%

In districts with 300 students or less, 25 percent use microcomputers for introduction to computer languages, including math, language arts, reading, social studies and science. Vocational education is taught in only 5% of the districts.

Only about 6 percent of the districts of 300 to 2,000 students use their microcomputers for a single instructional area, for example math skills, reading, etc. Introduction to

computer languages is the unique instructional area in 23 percent of the districts to which math, reading and language arts are added. Eighteen percent include social studies, science and vocational education.

Twenty percent of the districts of 2,001 to 5,000 students use microcomputers for all instructional areas, including vocational and microcomputer education. In 13 percent of these districts the only use of computers is for basic math skills. Twenty-seven percent teach computer languages, math, language arts, reading, social studies and science.

Twenty-five percent of 5,000 or over student districts teach introduction to computer languages and the academic areas.

In elementary school districts, 29 percent use microcomputers in the instructional area of introduction to computer languages, math skills, language arts, reading and social studies. Twenty-one percent do not teach social studies and 17 percent teach only introduction to computer languages. Thirteen percent use microcomputers only in the areas of language arts and reading. Only two districts (8%) cover all the instructional areas including vocational education.

In secondary school districts, introduction to computer languages is the primary (60%) instructional use of microcomputers. All instructional areas except vocational education are assisted by microcomputers in 20 percent of these schools with vocational education included in the remaining 20 percent.

An equal percentage of districts (24%) in the combined districts teach introduction to computer languages, all instructional areas and vocational education. Twenty-one percent use microcomputers to teach introduction to computer languages, language arts, reading and math, 11 percent social studies and science and 9 percent math skills.

The responses to "What type of students are using the microcomputers?" are illustrated in Table IX.

Table II. TYPE OF STUDENTS USING MICROCOMPUTERS

TYPE OF STUDENT	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
REGULAR	17%	25%	18%	7%	—	13%	—	20%
SPECIAL	1%	5%	—	—	—	4%	—	—
SPECIAL / GIFTED	1%	—	2%	—	—	—	—	1%
REGULAR / GIFTED	17%	15%	12%	27%	50%	25%	20%	16%
REGULAR / SPECIAL	6%	10%	7%	—	—	—	—	7%
ALL STUDENTS	53%	40%	57%	60%	50%	58%	80%	51%

Only one district of the one hundred four surveyed use their microcomputers for special education students only.

Seventeen percent of all school districts have only regular and gifted students using microcomputers with 50 percent of the largest districts falling in this catagory. The same percentage (17%) of all the districts have only regular students using their microcomputers, the largest percentage (25%) of these districts coming from the smaller of 300 or less students and only one district (1%) uses their microcomputers for special and gifted students only.

The majority of school districts (58%), regardless of district size, include all students in their microcomputer instructional program--40,57,60 and 50 percent, respectively, from the smallest to the largest school district. Fifty-eight percent of elementary, 80 percent secondary and 51 percent of combined districts include all students.

In 25 percent of the elementary school districts, regular and gifted students use microcomputers and 13 percent enroll regular students only. Only 4 percent of these districts use microcomputers in special education.

Twenty percent of secondary school districts included regular and gifted students in their microcomputer programs. Twenty percent of combined districts report that microcomputers are used in their school by regular students only, 16 percent for regular and gifted students and 7 percent special students and regular students. Only one of the seventy-one of these districts (2%) enrolls only special and gifted students in microcomputer assisted classes.

The responses to "Who trains district staff in microcomputer use?" are depicted in Table X.

Table I. MICROCOMPUTER TRAINING OF DISTRICT STAFF

STAFF TRAINING:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
UNIVERSITY PROFESSORS	2%	—	3%	—	—	—	—	3%
DISTRICT / SCHOOL STAFF	22%	20%	22%	33%	13%	29%	—	21%
VENDOR	1%	5%	—	—	—	—	—	1%
PRIVATE AGENCY	1%	5%	—	—	—	—	—	—
CONSORTIA	6%	—	5%	13%	—	8%	—	6%
UNIVERSITY / CONSORTIA / DISTRICT STAFF	37%	45%	35%	27%	50%	29%	60%	37%
UNIVERSITY / DISTRICT STAFF / VENDOR	14%	10%	13%	20%	13%	17%	40%	11%
VENDOR / CONSORTIA	13%	15%	13%	7%	13%	13%	—	14%
ALL RESOURCES	4%	—	5%	—	13%	4%	—	4%

Except for districts of 300 to 2,000 students, university and consortia staff are the predominent (37%) trainers of district staff in microcomputers. District or individual school staff train personnel in one third (33%) and one fourth (23%) of districts of 300 - 2,000 and 2,000 - 5,000, respectively. University professors and microcomputer

vendors train district staff in 14 percent of all school districts, and 13 percent are trained by vendor and consortia staff. Consortia staff alone train personnel in only 6 percent of the districts and only 4 percent of the districts are trained by all the possible training staff mentioned in the questionnaire. Only one school district employs vendor or private contracted agency for training.

The findings indicate that the largest (50%) districts use a combination of training personnel--university and consortia staff, district or school staff, vendor or contracted agency.

The data show that 29 percent elementary, 60 percent secondary and 37 percent combined school districts use a combination of university staff, district or school staff and consortia staff to train their personnel in microcomputer use.

In elementary school districts, an equal percentage (29%) report that their staff receives microcomputer training from district or school staff only, 17 percent by university staff, district or school staff and the microcomputer vendor. Thirteen percent receive training from local consortia staff only.

Personnel in the remaining 40 percent of the secondary school districts are trained by university staff, district or school staff and vendors. District or school staff train personnel in microcomputer use in 21 percent of the combined school districts, while vendors and consortia staff and microcomputer vendor train staff in an additional 11 percent of these districts.

The responses to "What are the district's greatest instructional needs using microcomputers?" are presented in Table XI.

Table XI. MICROCOMPUTER INSTRUCTIONAL NEEDS

INSTRUCTIONAL NEED:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
INTROD. TO COMPUTER LANGUAGES	19%	5%	25%	13%	25%	0%	20%	24%
MATH SKILLS	3%	5%	3%	—	—	—	—	4%
LA / READING	8%	15%	7%	—	13%	17%	—	4%
SOCIAL STUD./SCIENCE	1%	—	2%	—	—	—	—	1%
TYPING	2%	5%	—	7%	—	—	—	3%
BUSINESS / ECONOMICS / VOCATIONAL EDUCATION	15%	10%	20%	13%	—	—	60%	18%
COMPUTER LANGUAGES / MATH / L A / READING	34%	30%	33%	33%	38%	50%	20%	28%
MATH / L A / READING / SOCIAL STUD./SCIENCE	12%	15%	7%	20%	25%	21%	—	4%
TYPING / BUSINESS VOCATIONAL EDUCATION	1%	—	2%	—	—	—	—	1%

The findings in Table XI show that the largest percentage of all districts (34%) need computer instruction in computer languages, math, reading, and language arts-- 30 percent, 33 percent, 33 percent, and 38 percent, by district size, respectively.

In small districts under 300 students, the second priority is in language arts and reading (15%) or math, language arts and reading (15%). In districts of 300 to 2,000 students, introduction to computer languages is the second instructional need (25%) and business, economics and vocational education is the third instructional priority (20%). In district sizes ranging from 2,001 to over 10,000 students, math, language arts, reading, social studies and science are their second instructional need--20 percent and 25 percent, respectively. The third priority is introduction to computer languages, (13% and 25%, respectively).

The majority (50%) of the elementary school districts indicate need in the areas of introduction to computer languages, math, language arts and reading skills. Twenty-one percent need assistance in social studies and science as well as in math, language arts and reading skills. Seventeen percent indicate language arts and reading as their primary need and 8 percent , computer languages.

Sixty percent of secondary school districts reported business, economics and vocational education as a future need in CAI. An equal percentage (20%) needed CAI in introduction computer language, math, language arts and reading.

Twenty-eight percent of combined districts cite introduction to computer languages along with math, language arts, reading skills as their main instructional needs. Introduction to computer languages only is the main concern of 24 percent of combined school districts. Eighteen percent

cite business/economics and vocational education as the primary instructional need and 10 percent, math language arts, reading, social studies and science.

The findings indicate that the secondary school districts are more concerned about business, economics and vocational education, whereas the elementary or combination school districts are concerned with basic skills and introduction to computer languages.

The responses to "In which areas does the district foresee the need for microcomputer application?" are depicted in Table XII.

Table XII. MICROCOMPUTER APPLICATION NEEDS

APPLICATION NEED:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
ACCOUNTING / BUSINESS RECORDS / SCHEDULING	9%	5%	8%	13%	—	4%	—	10%
STUDENT INSTRUCTION	22%	15%	22%	20%	50%	21%	—	24%
INSERVICE TRAINING FACULTY / STAFF	3%	5%	3%	—	—	—	—	4%
STUDENT INSTRUCTION/ INSERVICE TRAINING	22%	20%	17%	33%	38%	42%	40%	16%
ACCOUNTING / BUSINESS RECORDS / SCHEDULING / TEST DATA	5%	10%	3%	—	13%	—	20%	6%
ACCOUNTING / BUSINESS RECORDS / SCHEDULING / STUDENT INSTRUCTION	30%	30%	38%	13%	—	21%	20%	32%
ALL AREAS	8%	15%	5%	13%	—	13%	—	6%

The two smallest district groups of up to 2,000 students indicate accounting, business records, scheduling and student instruction as their greatest needs for microcomputer

application (38% and 30%, respectively). Student instruction only is seen as a need by 22 percent of the districts of 300 to 2,000 students, whereas 22 percent of the districts of under 300 students need inservice training of staff and faculty in addition to student instruction. The latter is the priority need of 33 percent of districts of 2,001 to 5,000 students.

In the largest districts (5,001 to 10,000 students), a majority (50%) see student instruction only as their most important need in computer application, with 38 percent of this group adding inservice training of faculty and staff to the need for student instruction. Only one (5%) of these districts cites accounting/business records, scheduling and scoring and processing of tests.

The findings indicate that district enrollment size does not significantly determine microcomputer application needs in Illinois school districts.

The greater percentage (30%) of all combined districts as well as 21 percent of elementary school districts indicate accounting, business records, scheduling and student instruction as the priority need for microcomputer application. However, 42 percent of the elementary districts and 40 percent of secondary districts as well as 16 percent of combined districts name student instruction and inservice training of faculty and staff as their greatest need in this area.

Student instruction alone is seen as the top priority in computer application needs in 21 percent of the elementary districts and in 24 percent of combined school districts. Accounting, business records and scheduling is seen as the most important need for microcomputer application in 10 percent of the combined elementary-secondary groups but only 4 percent see this area as an important need in the elementary only group.

The secondary school districts evenly distribute the remaining priority needs (20% each) between two areas: accounting, business records, scheduling and testing; and accounting etc. and student instruction.

The findings indicate that student instruction appears to be the most important priority in microcomputer application in most school districts.

The responses to "How many of the districts' staff have and/or need microcomputer training?" are detailed in Table XIII.

Table XIII. DISTRICT STAFF TRAINING

DISTRICT STAFF:	TOTAL DIST	SIZE OF DISTRICT <300	SIZE OF DISTRICT 301-2,000	SIZE OF DISTRICT 2,001-5,000	SIZE OF DISTRICT 5,001-10,000	TYPE OF DISTRICT ELEM.	TYPE OF DISTRICT SEC.	TYPE OF DISTRICT COMB.
OFFICE.....HAVE	2%	5%	2%	—	—	—	—	1%
NEED	3%	5%	2%	7%	—	4%	20%	1%
FACULTY.....HAVE	18%	30%	17%	7%	25%	21%	20%	18%
NEED	19%	20%	22%	7%	25%	17%	—	21%
ADMIN./FAC....HAVE	12%	15%	10%	20%	—	21%	—	7%
NEED	4%	5%	2%	13%	—	4%	20%	3%
OFFICE / FAC..HAVE	1%	5%	—	—	—	—	20%	1%
NEED	2%	—	3%	—	—	4%	—	1%
ALL STAFF....HAVE	57%	30%	63%	60%	63%	46%	40%	63%
NEED	57%	60%	53%	60%	75%	50%	40%	61%
NONE.....HAVE	5%	15%	3%	—	—	8%	—	4%
NEED	8%	12%	—	—	—	8%	20%	7%

Table XIII shows that all members of the school districts' personnel including office staff, administration and teachers both have and need additional training in the majority (59%) of all the districts surveyed. Thirty percent, 63 percent, 60 percent, and 63 percent of staff from smallest to largest districts, respectively, have training as compared to 60 percent, 53 percent, 60 percent and 75 percent who need training.

The second largest group both having (18%) and needing (20%) computer training are the teachers in the school districts. A combined group of administrators and faculty have training in 12 percent of the districts, whereas only 4 percent of this combined group needs training.

Similarly, all members of the school districts' personnel, regardless of district type, including office staff, administrators and teachers both have and need training in microcomputers in the majority (57%) of districts surveyed--46 percent elementary, 40 percent secondary and 63 percent combined have training as compared to 50 percent, 40 percent and 61 percent that need training.

The second largest group both having (18%) and needing (19%) training are the teachers in the school districts. The faculty of 21 percent of elementary, 20 percent of secondary and 18 percent of combined districts have training in microcomputers in contrast to 17 percent elementary, 21 percent combined and no secondary school districts report a need for training in microcomputers.

The findings show that a significant majority of school districts have trained staff and have a need for training additional staff.

The responses to "Does the district intend to purchase additional microcomputers?" are presented in Table XIV.

Table XIV. ADDITIONAL MICROCOMPUTER PURCHASES

FUTURE COMPUTER PURCHASES:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
YES	87%	75%	87%	100%	88%	79%	80%	90%
NO	3%	10%	2%	—	—	8%	—	1%
UNDECIDED	10%	10%	12%	—	13%	13%	20%	7%

Table XIV illustrates an overwhelming majority of all districts (87%) intend to purchase additional microcomputers, whereas 3 percent of the districts do not intend to make any additional purchases at this time. Ten percent of the districts are undecided. All of the school districts with 2,001 to 5,000 students plan to buy additional microcomputers.

percent of the secondary and 90 percent of the combined districts have the intention to purchase additional microcomputers. Only 8 percent of elementary and 1 percent of combined districts do not intend to purchase more microcomputers. A small percentage (13% elementary, 20% secondary and 7% combined) are presently undecided about additional microcomputer purchases.

The responses to "What is the source of funds for the purchase of course-or software?" are reviewed in Table XV.

Table IV. SOURCE OF FUNDS FOR MICROCOMPUTERS

FUNDS SOURCE:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
CENTRAL ADMIN. / SCHOOL BUDGET	14%	20%	13%	13%	---	21%	60%	9%
FEDERAL	14%	15%	8%	27%	25%	21%	---	11%
GRANTS	2%	---	3%	---	---	---	---	3%
COMMUNITY (PTA,etc.)	4%	5%	3%	---	---	8%	---	3%
ADMINISTRATION / SCHOOL BUDGET / FEDERAL	20%	20%	22%	20%	13%	29%	---	20%
ADMINISTRATION / SCHOOL BUDGET / GRANTS	14%	10%	20%	---	---	4%	20%	16%
ADMINISTRATION / SCHOOL BUDGET / FEDERAL / COMMUNITY	22%	15%	22%	27%	38%	13%	---	28%
FEDERAL / GRANTS	3%	---	3%	---	13%	---	---	4%
ALL SOURCES	8%	10%	5%	13%	13%	4%	20%	7%

Information in Table XV shows that only the smallest districts of under 300 students cite central administration

and/or school budget as their main source of funds for microcomputers (20%). All other size groups (22%) indicate that the main microcomputer funds source is a combination of district administration and/or school budget, federal and community funds. Other districts report a combination of administration and/or school budget and federal funds (20%) or federal funds alone (14%) as the next most common source of funds for purchasing microcomputers and course-or software. Another 14 percent of the districts indicate that funds come from a combination of central administration/school budget funds and specific grants and 8 percent purchase microcomputers from a combination of all listed sources.

Only in the secondary school districts does central administration and/or school budget provide funds in a large percentage of the districts (60%). Another 20 percent state central administration/school budget combined with federal funds as the main source for microcomputer purchase and the remaining 20 percent indicate all sources listed in the questionnaire are used.

In the elementary school districts sources of funds vary with 21 percent coming from central administration/school budget, 21 percent from federal funds, 8 percent from community funds, 4 percent from central administration/school budget and grants and 13 percent from a combination of central administration/school budget, federal and community funds. Only 4 percent of the districts use all sources listed in the survey.

The seventy-one combined school districts use funds from all categories with 28 percent using central administration/school budget, federal and community funds, 20 percent central and school budget and federal funds, 16 percent central administration/school budget and grants, 11 percent federal funds only, and 9 percent central administration/school budget only. Another 7 percent of these districts use all the sources listed, 4 percent federal funds and grants, 3 percent grants only and another 3 percent use community funds only.

The findings indicate that size or type of district do not significantly determine the source of funds for the purchase of microcomputers and course-or software. They also indicate that the source of funds for purchasing microcomputers is varied throughout the districts and no one source significantly leads the others according to district size or type.

The responses to "Where does the district purchase software?" are presented in Table XVI.

Table XVI. SOFTWARE SOURCES

SOFTWARE SOURCE:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
VENDOR	33%	45%	33%	13%	25%	25%	40%	32%
PUBLISHER	5%	—	5%	13%	—	8%	—	4%
CONSORTIUM	9%	25%	10%	—	—	—	—	13%
VENDOR / PUBLISHER	39%	20%	40%	60%	38%	42%	60%	37%
VENDOR / CONSORTIUM	8%	15%	7%	—	13%	8%	—	9%
VEND./PUB./CONSORT.	8%	5%	5%	13%	25%	17%	—	6%

The data in Table XVI indicate that the main agents from which all districts of more than 300 students purchase computer software are computer software vendors (33%) or vendors/publishers (39%). Only the districts of under 300 students designate the software vendors as their main software purchasing source. In these districts, a combination vendor/publisher is the second source of computer software (20%). Twenty percent of the districts of 300 to 2,000 students purchase software from the vendors only and 10 percent of these districts purchase from the consortium.

In districts of 2,001 to 5,000 students the remaining percentage of software purchasing is distributed evenly (13%) among the other sources listed.

The largest districts (over 5,000 students) also purchase software from the vendors (25%) or from vendor/publisher/consortium (25%).

Analysis by type of school district shows that 42 percent elementary, 60 percent secondary, and 37 percent combined districts purchase microcomputer software from both vendors or vendor/publisher. Only combined districts (13%) buy software from the consortium, while 17 percent of elementary districts purchase software from vendors and/or publishers and consortium as does 6 percent of combined districts.

The data indicate that most software is purchased from vendors or vendor/publishers.

The responses to "Where does the district receive assistance with respect to application of microcomputers in the schools?" are presented in Table XVII.

Table XVII. MICROCOMPUTER APPLICATION ASSISTANCE

ASSISTING AGENCY:	TOTAL DIST	SIZE OF DISTRICT				TYPE OF DISTRICT		
		<300	301-2,000	2,001-5,000	5,001-10,000	ELEM.	SEC.	COMB.
STATE BOARD OF EDUC.	4%	5%	3%	—	13%	—	—	6%
CONSORTIA	34%	35%	30%	40%	38%	50%	40%	30%
ISBE / CONSORTIA	14%	20%	12%	13%	25%	13%	20%	13%
NO ASSISTANCE	35%	25%	40%	40%	13%	33%	40%	34%
VERY LITTLE ASSIST.	13%	15%	15%	7%	—	4%	—	17%

Districts of under 300 students (35%) as well as districts of 2,001 to 10,000 students (40% and 38%) indicate that consortia are the main source of computer application assistance; however, the greater percentage (40%) of districts of 300 to 2,000 students indicate that they receive no assistance for application of microcomputers in the schools. Thirty percent of these same districts indicate that they receive assistance from consortia. A significant percentage (40% and 25%) of districts with 2,001 to 5,000 and under 300 students indicate that they receive no assistance.

Twenty-five percent of the districts of over 5,000 students as well as 20 percent of the districts under 300 students report that they receive assistance from both the State Board of Education or local consortia. With a combined district percentage of only 4 percent reporting microcomputer application assistance and 35 percent reporting no assistance at all, the findings indicate a lack of assistance from the State Board of Education. The local consortia at 34 percent of the total districts has been providing the needed assistance in its place.

An almost equal percentage of all districts report that they receive no assistance with respect to application of microcomputers (35%) and that they receive assistance from consortia only (34%).

Fifty percent of elementary school districts receive assistance from consortia, 40 percent of secondary school districts and 30 percent of combined districts.

No assistance is received by one-third (33%) of elementary districts, 40 percent of secondary districts and 34 percent of combined districts. Only 6 percent of combined districts report that they receive assistance form the State Board of Education, whereas no other district reports State Board assistance.

Thirteen percent of all districts report that they receive very little assistance from any agency.

The findings indicate that the State Board of Education is not providing significant assistance to the school districts in the area of microcomputer application.

In addition to the fourteen forced answer questions, respondents were asked to respond to six open-ended questions. These questions were answered by eighty-nine of 104 respondents. The responses were analyzed according to frequency of response.

The most frequent responses to the question "What are the advantages of using microcomputers in the schools?" were:

1) Teaches students computer awareness as a preparation for the future.
2) Motivation for the students.
3) Individualization of instruction.
4) Efficiency of instruction.
5) Allows for immediate feedback, CAI, administrative efficiency, better teacher management drill and reinforcement and varied instruction.
6) Effectiveness for teaching gifted as well as below average students.
7) Teaches problem solving or logical thinking.

The responses to "What are the disadvantages or problems of using microcomputers in the schools?" also varied as follows:

1) Lack of hardware due to cost,
2) Lack of trained teachers,
3) Accessibility to the microcomputers in the schools,
4) Teacher resistance to or fear of new technology,
5) Poor quality software,
6) Lack of time for evaluating software,
7) Software does not meet student or instructional needs.
8) lack of time for CAI, scheduling and organization of computer time.

The responses to "What is your evaluation of available microcomputer course-or software?" showed a concern about the quality of software available to the schools:

1) Great care is needed in selecting good software.
2) Available software ranges from excellent to very poor. As much as 40 percent fo the software available is worthless and only 5 percent is excellent.
3) Software is improving but needs improvement.

When asked "What are your course-or software needs?", the responses were:

1) More quality software for math, language arts and reading.
2) More simulation software in social studies and science.
3) CAI in all subject areas.
4) More software coordinated with textbooks.
5) Computer literacy programs for the elementary school curriculum.
6) Remedial, problem solving, workshops for software review, primary reading drill, inservice training, .. economical administrative programs, word processing, programming for gifted students, computer awareness for mainstreamed students, and elementary computer awareness coordinated with secondary computer curriculum.

The responses to the question "What are the most important traits or types you would like to see in future course-or software?" varied as follows:

1) User friendly.
2) Software that can be integrated into the existing curriculum.

3) Software which teaches skills rather than drill.
4) Software which teaches higher thinking skills, has good pacing, and is more educational but less game oriented and expensive.
5) Better instructional manuals, vocational awareness, integration with textbooks, branching, sequential development of skills, and good graphics.

The responses to "What assistance do you receive from the State Board of Education or regional consortia with respect to application of microcomputers in the schools?" were also varied. Twelve districts received software reviews and inservice training. Seven districts were provided reduced rates on software. Four districts obtained assistance in curriculum development. TENCO Consortium and MECC provided services to five districts in terms of inservice training and software.

On the other hand, several districts criticized the State Board of Education for "not having a visible plan for implementing technology in the schools", "for weak leadership", "for failing miserably", "for disorganization", and for "providing little assistance needed to purchase hardware". However, three respondents stated that the ISBE

had provided them with monetary assistance for consultants, free programs, and informational publications. One respondent commented that "the concept of consortia in this state only fosters pitting downstate schools against the Chicago area schools for the meager funds available".

SUMMARY AND CONCLUSIONS

Summary of Principal Findings

The following summary is based on the tabulation of the total responses to the Microcomputer Needs Assessment Questionnaire, consisting of fourteen forced choice questions and six open-ended questions.

An analysis of the responses to "What types of microcomputers are being used in Illinois school districts?" showed that most school districts (46%) used two types of microcomputers, and the Apple was the single most used (34%) microcomputer. TRS-80 was the second (4%).

The findings indicated that more districts (41%) owned from eleven to twenty-five microcomputers, the majority (60%) were very satisfied with the use of microcomputers in their schools and most districts (87%) intended to purchase additional microcomputers.

An analysis of the responses to "For what are the microcomputers used?" indicated that most districts (41%) used their computers for accounting and business purposes as well as instruction. The instructional program of most districts (49%) included awareness/literacy/programming and CAI in all areas, and the specific instructional area

assisted by microcomputers in many districts (23%) was introduction to computer languages. Twenty-two percent also included math, language arts and reading skills.

All students in the majority (53%) of school districts used microcomputers. Thirty-seven percent of school districts used a combination of university professors, district or individual school staff and consortia staff to train their staff.

An analysis of school district microcomputer instructional needs indicated that many districts (34%) needed assistance in introduction to computer languages, math, language arts, and reading; while 30 percent of the districts needed computer application training in accounting, business records, scheduling as well as student instruction was needed by 30 percent of the districts.

The findings indicated that administrators and faculty in 57 percent of the districts surveyed had training, but 57 percent of districts needed additional microcomputer training for all types of personnel.

An analysis of responses to "What is the source of funds for the purchase of microcomputers and course-or software?" revealed several sources used. Twenty-two percent used central administration and/or school budget, federal and community funds; 20 percent central administration and/or school budget funds and grants. Most school districts purchased microcomputers from their budgets, but they used supplementary funds from other sources to upgrade their microcomputer programs.

Software was purchased by most districts (70%) through software vendors of which 39 percent purchased from the software publisher. Problems with software selection and use were prevalent. Many districts indicated that great care had to be taken in selecting quality software. Much of the software available was of poor quality and expensive and the preview of software before purchase was not often available.

The responses to "What assistance do you receive from the State Board of Education and regional consortia with respect to application of microcomputers in the schools?" were analyzed statistically according to percentage as well as frequency of reply as an open-ended question. The findings indicated that 35 percent of districts received no assistance from the State Board of Education, while 34 percent received assistance from regional consortia in terms of inservice training of staff, software reviews and reduced rates on software purchases.

Findings in Terms of District Size and Type

A number of factors were found that are directly attributed to the size and type of district. The largest districts had the most microcomputers, utilized the most varied sources of funding and were the most satisfied users of microcomputers.

On the other hand, the data indicated that instructional uses for all districts were varied and no significant pattern emerged as a result of district size. Most secondary districts used their microcomputers for computer education rather than CAI.

Nor did district size appear to determine the instructional needs. However, secondary districts needed assistance in business, economics and vocational education in contrast to introduction to computer languages, math, language arts, and reading for elementary districts. Student instruction was the most important priority in microcomputer application in most school districts regardless of size or type of district. Plans to purchase additional microcomputers and need for staff training appeared to be a function of size or type of school district.

Implications

The findings of this study revealed an increased trend and emphasis toward microcomputer assisted education. If most Illinois school districts intend to purchase more hardware and software to increase their existing microcomputer programs, they need to seek additional funds from various sources to supplement the central administration and school budgets.

The data showed that all students used microcomputers in the schools not just specific groups-- remedial or gifted students. Most CAI programs did not include remedial and gifted students, yet self-pacing and immediate feedback for individualization would be particularly helpful and motivational for them. Perhaps the lack of time for software review, funds and quality software may be one of the reasons for not providing CAI for special students.

Most districts reported that staff and/or teachers need additional training in microcomputer use and applications. Many respondents cited teacher resistance to or fear of new technology as a problem in using microcomputers. Inservice training which attempts to eliminate this fear or resistance is needed.

Quality software is necessary for a successful microcomputer program. The findings indicated that software quality has improved. As the main sources of software,

vendors and/or publishers could also be instrumental in eliminating teacher resistance through profitable software review presentations and easy-to-read documentation. Effective presentations would alleviate teachers' fears, thus increasing potential sales and thereby lowering program costs as sales increased. All parties would benefit. Many textbook publishers develop software programs to supplement their textbooks. This is another free source of inservice and exposure to CAI available to the school districts.

The Illinois State Board of Education appeared to provide only minimal leadership in the development of microcomputer programs and services. Individual school districts must continue to be responsible for the development of microcomputer assisted education at the local level. It appears that school districts must motivate the Illinois State Board of Education to develop comprehensive state-wide microcomputer programs and to provide the necessary resources and tools to meet the needs of the school districts.

Recommendations

The following recommendations are applicable:

1. To provide time and encouragement for inservice training of staff and/or teachers in use and applications of microcomputers in education. The following elements should be included in microcomputer courses for teachers:
   a) Activities to overcome negative attitudes or fears.
   b) Definition of computer terms.
   c) Familiarity and hands-on experience with major components of the several microcomputer systems.
   d) Familiarity and hands-on use with the operations of several microcomputer systems.
   e) Provide a good foundation in basic programming.
   f) Exposure to sources of information on microcomputers (books, journals, organizations and courses).
   g) Critique software.
   h) Critique hardware.
   i) Computer store visitations.
   j) Role of computers in education and society.
   k) Classroom application of microcomputers.
   l) Microcomputers and curriculum application.
   m) Microcomputer data management.
   n) The possible evolution of new roles for teachers and students.
   o) Career preparation and opportunities.

2. To explore all possibilities for funds to purchase additional microcomputer hardware and software.
3. To provide time for careful review of software in order to purchase quality programs that are compatible with district instructional objectives.
4. To establish an administration/teacher/student software review committee.
5. To take advantage of services provided by regional consortia in terms of inservice training, software review and software price reductions.
6. To motivate the Illinois State Board of Education to provide assistance in terms of microcomputer curriculum development.
7. To provide additional CAI programs for remedial and gifted students.
8. To require state certification of teachers to teach microcomputer education.

In addition, it is recommended that this study be replicated to include: (1) both urban and rural districts, (2) different SES school district populations, and (3) a larger sample. Considering that microcomputers have only been available for purchase to the schools for seven years, this study was conducted early in the development of microcomputer assisted education in Illinois. Therefore, continual research should be conducted to assess the further development of microcomputer programs in Illinois schools.

The information explosion and ready access to the influence of computers in society pose many challenges to the traditional concepts of education. For administrators and teachers, it means they must be open to the educative potential of microcomputers and the electronic age.